

REMARKS

Overview

In the Office Action under reply, the first Action on the merits, claims 1-17 are pending, claims 18-31 having been withdrawn by the Examiner as directed to non-elected subject matter. The claims have been rejections as follows:

(1) claims 1, 3, and 9-14 are rejected under 35 U.S.C. §102(b) as anticipated by Karis et al., US 6,194,360 (hereinafter “Karis”);

(2) claims 1-5, 9-10, and 12 are rejected under 35 U.S.C. §102(b) as anticipated by Khan et al., US 5,907,456 (hereinafter “Khan”);

(3) claims 1-2, 4-5, 10, and 15-17 are rejected under 35 U.S.C. §102(b) as anticipated by Diaz et al., US 5,886,854 (hereinafter “Diaz”); and

(4) claims 6-8 are rejected under 35 U.S.C. §103(a) as unpatentable over Diaz in view of Konno et al., US 5,358,339 (hereinafter “Konno”).

The Examiner has request that applicants provide a new title that is clearly indicative of the invention to which the claims are directed. The Examiner has also objected to the disclosure because of a typographical error in claim 6.

The rejections and objections are overcome in part by the amendments made herein, and are otherwise traversed for at least the following reasons.

Claim amendments

With the amendments made herein, claim 1 has been amended to specify that the bearing is selected from a journal bearing, a thrust bearing, a spiral groove bearing, a herringbone groove bearing, or that the bearing is formed from surfaces that are embossed with grooves to create an internal pressure within a lubricant. Furthermore, claim 1 has been amended to specify that the charge-control additive is comprised of dioctyldiphenylamine, an oligomer comprising dioctyldiphenylamine, or a combination of the foregoing. Support for these amendments can be found in the original claim language (i.e., claims 4-8, 11). Claims 11 and 13 have been canceled, and claim 12 has been amended in light of the amendment to claim 1. Claim 6 has been amended to include a period (i.e., “.”) after the word “bearing.” Claim 14 has been amended to correct the spelling of the term dioctyldiphenylamine. The correct spelling of this term would be readily apparent to one of ordinary skill in the art. No new matter has been added by these amendments.

Rejection under 35 U.S.C. §102(b)

Claims 1, 3, and 9-14 stand rejected under 35 U.S.C. §102(b) as anticipated by Karis. The Examiner states on pages 3-4 of the Action that Karis teaches “a charge-control additive (lines 57-58 in column 4, for instance, i.e., “copolymer of phenylnaphthylamine and dioctyldiphenylamine”) for reducing charge accumulation in the bearing (i.e., the copolymer of phenylnaphthylamine and dioctyldiphenylamine will inherently reduce charge accumulation in the bearing to some extent).” Applicants traverse this rejection.

The disk drive system of the pending claims requires, in part and as amended herein, a bearing that serves as an interface between the stator and the rotor, wherein the bearing is selected from a journal bearing, a thrust bearing, a spiral groove bearing, a herringbone groove bearing, or wherein the bearing is formed from surfaces that are embossed with grooves to create an internal pressure within a lubricant.

In contrast, the magnetic recording device of Karis is limited to devices that utilize ball bearings for the spindle motor. The abstract of Karis states that the magnetic recording devices include a spindle motor comprising “*ball bearings* lubricated by a grease” (emphasis added). At col. 2, lines 1-6, Karis states that “[t]he spindle motor is preferably a brushless direct current spindle motor comprising... ball bearings positioned in races formed in the shaft and/or hub...” At col. 3, lines 7-9, Karis states that “[b]all bearings 52, 54, 56 and 58 are disposed in the annular race track formed by races 44, 46, 48 and 50.” Karis further states in col. 3, lines 20-21, that “[t]he annular race is in contact with a unique lubricating grease which lubricates the ball bearings moving in the race.” Karis does not, in fact, suggest or state that the bearings used with the spindle motor in the magnetic recording device may be anything other than ball bearings. Karis does not, therefore, teach all of the limitations of the pending claims, as would be required for anticipation under 35 U.S.C. §102. Accordingly, applicants respectfully request withdrawal of the rejection.

Rejection under 35 U.S.C. §102(b)

Claims 1-5, 9-10, and 12 stand rejected under 35 U.S.C. §102(b) as anticipated by Khan. The Examiner states that Khan teaches “a lubricant (60) disposed in the bearing, wherein the lubricant is comprised of a lubricating medium (line 58 in column 7, for instance, i.e., “oil”, for

instance) and a charge-control additive (lines 31-32 in column 7, for instance, i.e., phenyl alpha naphthylamine”) for reducing charge accumulation in the bearing (i.e., phenyl alpha naphthylamine will inherently reduce charge accumulation in the bearing to some extent).”

Applicants traverse this rejection.

The disk drive system of the pending claims requires, in part and as amended herein, a lubricant comprising a charge-control additive that is comprised of dioctyldiphenylamine, an oligomer comprising dioctyldiphenylamine, or a combination of the foregoing.

In contrast, Khan teaches a lubricant that is mixed with a certain combination of additives in order to achieve desired properties for the lubricant. The additives provide anti-oxidation, anti-corrosion, and metal-deactivating properties for the lubricant (see col. 7, lines, 21-23). Khan mentions phenyl alpha naphthylamine as a suitable antioxidant. However, Khan does not mention that phenyl naphthylamine, or any other compound, may be used in the formulation as a charge-control additive. In particular, Khan does not mention (nor does Khan suggest) dioctyldiphenylamine as a charge-control additive. Accordingly, the teachings of Khan do not anticipate the claims, and withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. §102(b)

Claims 1-2, 4-5, 10, and 15-17 stand rejected under 35 U.S.C. §102(b) as anticipated by Diaz. The Examiner states that Diaz teaches a lubricant that is “comprised of a conductivity-enhancing additive (line 8 in column 8, for instance, i.e., “polyaniline”) for enhancing the electrical conductivity of the lubricant (i.e., polyaniline will inherently enhance the electrical conductivity of the lubricant to some extent.” Furthermore, the Examiner states that Diaz teaches “the conductivity-enhancing additive is comprised of an aniline, an oligomer thereof, a polymer thereof, a combination of the foregoing (line 8 in column 8, for instance).” Applicants traverse this rejection.

The disk drive system of the pending claims requires, in part and as amended herein, a lubricant comprising a charge-control additive, wherein the charge control additive comprises dioctyldiphenylamine, an oligomer comprising dioctyldiphenylamine, or a combination of the foregoing. Diaz, however, neither mentions nor suggests such a compound as an additive for the lubricant. In columns 5-6, Diaz describes a variety of “antistatic additives.” These additives are, in reality, intended to increase the *conductivity* of the lubricant. The description of the antistatic

additives does not, however, include dioctyldiphenylamine, an oligomer comprising dioctyldiphenylamine, or a combination thereof. Accordingly, Diaz fails to recite or teach all of the limitations of the pending claims, and applicants respectfully request withdrawal of the rejection.

Rejection under 35 U.S.C. §103(a)

Claims 6-8 stand rejected under 35 U.S.C. §103(a) as unpatentable over Diaz in view of Konno. The Examiner states that Diaz is silent as to spiral groove bearings, herringbone groove bearing, and also wherein the bearing is formed from surfaces that are embossed with grooves. The Examiner contends that these teachings are provided by the teachings of Konno.

The shortcomings of Diaz are discussed in the proceeding section. Specifically, Diaz fails to disclose a lubricant comprising a charge-control additive, wherein the charge control additive comprises dioctyldiphenylamine, an oligomer comprising dioctyldiphenylamine, or a combination of the foregoing. Konno does not provide this teaching. Rather, Konno discusses conductivity of the lubricant by addition of an electrically conductive substance such as polyoxyethylene or graphite powder (see col. 9, lines 13-19). Clearly, such a disclosure would not be sufficient to suggest to one of ordinary skill in the art the use of additives comprising dioctyldiphenylamine as discussed in the specification and claims of the current application. Accordingly, the combination of Diaz and Konno does not present a *prima facie* case of obviousness for the pending claims, and applicants respectfully request withdrawal of the rejection.

CONCLUSION

All pending claims are in a condition for allowance, and applicants respectfully request such action. If the Examiner has any questions about this response or about the application, a telephone call to the undersigned would be appreciated.

Respectfully submitted,

By:



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